

(1) said DNA fragment encodes a part of the protein, wherein said protein has protoporphyrinogen oxidase activity in plants;

(2) said DNA fragment has a sequence that can be detected and isolated by DNA-DNA or DNA-RNA hybridization to a nucleic acid sequence encoding an amino acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2 and SEQ ID NO:3, wherein said DNA-DNA or DNA-RNA hybridization occurs under 2X PIPES buffer, 50% deionized formamide, 0.5% (w/v) SDS, 500µg/ml denatured sonicated salmon sperm DNA at 42°C overnight; and said DNA fragment remains hybridized after washing in 2X SSC, 1% (w/v) SDS;

(3) said DNA fragment encodes the part of the protein in which an amino acid corresponding to Val13 of SEQ ID NO:1, or SEQ ID NO:2 or SEQ ID NO:3 is substituted by another amino acid; and

(4) said DNA fragment has an ability to confer resistance to protoporphyrinogen oxidase-inhibiting herbicides in plant or algal cells when expressed therein.

2. (Amended) The method according to claim 1, wherein the plant is a dicot.

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4. (Amended) The method according to claim 1, wherein the plant is a monocot.

Sub E²

6. (Amended) The method according to claim 1, wherein the DNA fragment encodes a protein or a part of the protein, wherein said protein has protoporphyrinogen oxidase activity in *Chlamydomonas*, and the DNA fragment encodes the protein or the part of the protein in which an amino acid corresponding to Val13 of SEQ ID NO:1 is substituted by another amino acid.

Sub E³

15. (Amended) An isolated DNA fragment which has the following characteristics:

(1) said DNA fragment encodes a part of the protein, wherein said protein has protoporphyrinogen oxidase activity in plants;

(2) said DNA fragment has a sequence that can be detected and isolated by DNA-DNA or DNA-RNA hybridization to a nucleic acid sequence encoding an amino acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2 and SEQ ID NO:3, wherein said DNA-DNA or DNA-RNA hybridization occurs under 2X PIPES buffer, 50% deionized formamide, 0.5% (w/v) SDS, 500µg/ml denatured sonicated salmon sperm DNA at 42°C overnight; and said DNA fragment or its complement remains hybridized after washing in 2X SSC, 1% (w/v) SDS;

(3) said DNA fragment encodes the part of said protein in which an amino acid corresponding to Val13 of SEQ ID NO:1 or SEQ ID NO:2 or SEQ ID NO:3 is substituted by another amino acid; and

④ (4) said DNA fragment has an ability to confer resistance to protoporphyrinogen oxidase-inhibiting herbicides in plant or algal cells when expressed therein.

16. (Amended) The isolated DNA fragment according to claim 15, wherein the plant is a dicot.

⑤ 18. (Amended) The isolated DNA fragment according to claim 15, wherein the plant is a monocot.

20. (Amended) The isolated DNA fragment according to claim 15, wherein the plant is the green alga *Chlamydomonas* and the DNA fragment encodes an amino acid sequence resulting from replacement of Val13 of SEQ ID NO:1 by another amino acid.

⑥ Sub E⁴ 21. (Amended) ~~The isolated DNA fragment according to any of claims 15 to 20,~~ wherein said another amino acid is methionine.

22. (Amended) The isolated DNA fragment according to claim 20, wherein the DNA fragment has a sequence that can be isolated from genomic DNA of *Chlamydomonas*, the DNA fragment encodes a protein or a part of the protein, wherein the protein has protoporphyrinogen oxidase

activity, and a nucleotide corresponding to guanine at position 37 (G37) of SEQ ID NO:4 replaced with another nucleotide.

①⁶ 23. (Amended) The isolated DNA fragment according to claim 22, wherein said another nucleotide is adenine.

24. (Twice Amended) A plasmid comprising the DNA fragment described in claim 15.

Please add the following new claims:

①⁷ --41. (New) A method of conferring resistance to protoporphyrinogen oxidase-inhibiting herbicides upon plants or plant cells, comprising introducing a DNA fragment or plasmid containing the DNA fragment into plants or cells, wherein said DNA fragment is expressed and has the following characteristics:

(1) said DNA fragment encodes a part of said protein, wherein the protein has protoporphyrinogen oxidase activity in plants;

(2) said DNA fragment has a sequence that can be detected and isolated by DNA-DNA or DNA-RNA hybridization to a nucleic acid sequence encoding SEQ ID NO:1, wherein said DNA-DNA or DNA-RNA hybridization occurs under 2X PIPES buffer, 50% deionized formamide, 0.5% (w/v) SDS, 500µg/ml denatured sonicated salmon sperm DNA at 42°C overnight; and

said DNA fragment or its complement remains hybridized after washing in 2X SSC, 1% (w/v) SDS;

(3) said DNA fragment encodes a part of a protein in which an amino acid corresponding to Val13 of SEQ ID NO:1 is substituted by another amino acid; and

(4) said DNA fragment has an ability to confer resistance to protoporphyrinogen oxidase-inhibiting herbicides in plant or algal cells when expressed therein.--

⑦ --42. (New) An isolated DNA fragment which has the following characteristics:

(1) said DNA fragment encodes a part of said protein, wherein the protein has protoporphyrinogen oxidase activity in plants;

(2) said DNA fragment has a sequence that can be detected and isolated by DNA-DNA or DNA-RNA hybridization to a nucleic acid sequence encoding SEQ ID NO:1, wherein said DNA-DNA or DNA-RNA hybridization occurs under 2X PIPES buffer, 50% deionized formamide, 0.5% (w/v) SDS, 500µg/ml denatured sonicated salmon sperm DNA at 42°C overnight; and said DNA fragment remains hybridized after washing in 2X SCC, 1% (w/v) SDS;

(3) said DNA fragment encodes a part of a protein in which an amino acid corresponding to Val13 of SEQ ID NO:1 is substituted by another amino acid; and

7 (4) said DNA fragment has an ability to confer resistance to
protoporphyrinogen oxidase-inhibiting herbicides in plant or algal cells
when expressed therein.--